

Preliminary

THE NON-AGRICULTURAL DEMAND FOR LAND:

A Report Submitted  
to the  
Agricultural Land Preservation Committee  
by  
Sub-Committee III

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Research and Analyses Accomplished

by the

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### Summary of Findings

1. If present land consumption trends continue, Maryland's land area will support an average density of 623 people per square mile in the year 2000. The 1970 density was 397 people per square mile.
2. Since 1949, more than 1.2 million acres have been withdrawn from agricultural use. The rate of decline has averaged 62,600 acres per year.
3. Total land committed to non-agricultural use, including urban related development and park and open space acreages, will nearly double from 1.0 million acres in 1970 to 1.7 million acres in 2000.
4. Regional growth trends indicate that by the year 2000, 45% of the Metropolitan Baltimore region and 50% of the Suburban Washington region will be committed to urban-related development and open space.
5. Residential area commitments amounted to 351,000 acres, or 5.5% of Maryland's land area in 1970. By 2000, 483,000 acres, or 7.6% of the land area will be utilized for residential purposes if development trends continue.
6. Available commercial forest area data indicate that acreage is decreasing at a Statewide rate of 8.8% per year. If this rate continues, commercial forest area will decrease from 2.5 million acres in 1970 to 1.7 million acres in 2000.
7. Statewide managed open space acreage is expected to increase from 210,000 acres in 1970 to 330,000 acres by 1990.
8. Large acreages of land are also held by speculative forces in anticipation of future development. These lands are usually not available for serious agricultural endeavor. The complexity of forces in the land conversion process makes a quantification of these acreages virtually impossible.

## CONCLUSIONS

This report has attempted to assist in determining the need for preservation of agricultural land in Maryland by revealing the non-agricultural land demands and population growth trends of the past and for the future. These analyses were also supplemented by studies of the trends in agricultural and forest area land usage. Examination of the material presented will make a meaningful contribution to the understanding of many of the aspects of agricultural land preservation.

The available data clearly indicate that agricultural preservation should not be based completely on urban-related land demands alone. The three significant statistics of the report emphasize this point well:

1. that the expected farmland decrease based on continuation of trends will be approximately 1.9 million acres;
2. that commercial forest area could decrease by .8 million acres, and
3. that .8 million additional acres will likely be committed to non-agricultural purposes by the year 2000.

In other words, it is anticipated that agricultural and commercial forest land areas will decrease more than three times as much as urban-related land commitments will increase. An unknown amount of this "decrease" over and above the non-agricultural demands must be considered in a transitional stage in the complete conversion process from farms or vacant land to the irreversibly urban committed. In this category are lands being held for urban speculation, those reverted to non-productive woodland or vacant land in anticipation of a change in use, and those abandoned for other purposes. Because of the complex factors in the consumption/conversion process, it is impossible to accurately quantify these transitional land use categories.

Agricultural land preservation techniques can therefore only be based in part on accommodation of future population growth and non-agricultural land commitments. The forces influencing the future of agricultural land are apparently in many cases not directly land oriented. There are national economic and international trade policies that influence the competitive framework within which individual decisions are made that ultimately determine the future use of today's farmland.

## BACKGROUND AND METHODOLOGY

Maryland's location within the Megalopolitan corridor connotes an urban lifestyle characterized by extensive developments, intensive usage of land and dense populations. Because the supply of land is inelastic, and because the demands for land to accommodate population growth are increasing, economic trade-offs between the resource and consumption values of land must be delicately weighed. It is therefore desirable to know the past and present patterns of land usage and to consider the future land requirements as they consume agricultural land, wetlands, commercial forest areas, and other undeveloped or vacant land.

In the consumption/conversion process, land and population are the dynamic variables. In this analysis, per capita consumption rates and land area to population ratios, and the changes in these measures through time, are the real indicators of the pattern of land consumption and conversion in Maryland.

Maryland has approximately 8.2 million acres, of which 6.6 million are land and wetland areas. The 300,000 acres of wetlands are defined as seasonal or permanent-standing water  $\leq 6.0$  feet and with sufficient moisture to support aquatic or semi-aquatic plant growth.<sup>1/</sup> The land and wetland areas of the State are not constant; and shore erosion and public works projects, such as the land drainage activity under PL-566, are expected to simultaneously reduce the total land and wetland acreage. The total land area is expected to decline from 6,318,965 acres in 1967 to 6,301,000 acres by 1986.<sup>2/</sup> The land and wetland areas of Maryland are presented in Table 1. (Other items in Table 1 will be discussed later in the text.)

Generally, sources have not always made the distinction between land area and total area when reporting data. For most purposes, the county land area changes are minimal, and for this report, ratios and other estimates are based on the total land area (1967) reported in Table 1.

On this relatively constant land area is a rapidly changing population. Maryland population data indicate that the State experienced a rapid post-World War II boom but that the rate of growth has declined since 1960. Regionally, the growth has been unbalanced, with a tremendous rate of increase in the Suburban Washington and Metropolitan Baltimore areas, moderate growth in the Southern Maryland and Frederick regions, and a slower rate of increase in the Western Maryland and Eastern Shore regions. Total State population is expected to increase at a progressively decreasing rate from 3,922,399 in 1970 to 6,149,500 in the year 2000.<sup>3/</sup> The actual population figures and projections for selected time periods are presented by county, region, and for the State in Table 2. These data are also presented in Figure 2 for regional comparison. The present change in growth by region is indicated in Table 3.

The statistic which best relates the land area to population growth is density. In Table 4 is indicated the county, regional, and State densities since 1940, including the projections to 2000. The pattern which emerges is similar to the population growth pattern. Metropolitan counties have high and increasing densities while rural agricultural counties have low and fluctuating or slowly increasing densities. The rapid increase in density of the Southern Maryland region is significant and probably indicates a basic change in the character of the region in the future. The Frederick region exhibits a similar change, and both undoubtedly are reflective of the expansion of the Suburban Washington/Metropolitan Baltimore corridor.



The purpose of this report is to determine the approximate non-agricultural demands for land to the year 2000. These demands are projected largely on the basis of past and current trend assumptions in accordance with projected population. Data are tabulated on the regional and state levels and indicate the relative balance and distribution of various land uses. The significance of analyzing data at the regional level is realized when the planning regions (Figure 1) are viewed as historical, geographical, and economic units.

The detail of analysis has been limited by the availability of reliable data. Basic sources of data included U. S. Census Bureau publications, Maryland county comprehensive plans, Maryland regional development plans, and special topical reports such as housing or resource inventories. Although a wide variety of source materials were utilized, there were occasions when it was difficult to establish clear temporal patterns of land usage. Where possible, future trends have been determined from simple regression analyses. Where the data have been less than sufficient, future trends have been determined on the basis of existing ratios. Preliminary population projections based on employment trends were generated by the Department of State Planning and were used for the year 2000.

It is important that the future area commitments be interpreted in light of the assumptions under which they were made. These estimates should also be considered as approximations or ranges of most likely occurrence rather than as attempts to describe the exact future requirements of various land uses. Occasionally, data were either non-existent or inadequate for projection.

Often, sources reporting the same data conflicted. Some of the differences can be attributed to methods or classification schemes. In other cases, it was evident that results from earlier studies were adopted without explanation or data revision to later studies, apparently in lieu of resurveying or of obtaining accurate data. The problems of different time period data grouped together, especially when placed in larger temporal ranges, are difficult to correct and raise doubts concerning the accuracy of the other data. An example of this is explained later in relation to total developed area statistics and is also presented in Table 5.

## THE NON-AGRICULTURAL DEMAND FOR LAND

In determining the demands which will be placed on land to accommodate expected population growth, it is desirable to gain an understanding of those classifications of land which are predominant in terms of area at this time and to tentatively anticipate what the future outlook for these categories of land may be.

The largest usage of land in most counties is for agricultural production. In general, Maryland's agricultural land has been decreasing since 1900 at a moderate rate, and since 1949 at a rapid rate. Various reports have attempted to trace the decline of land in farms and to project future acreages. These reports indicate that the rate of decrease is expected to slow considerably. However, regression analyses of agricultural acreage do not support this suggestion, and in this report the agricultural acreages are projected from the historic trend.<sup>4/</sup>

The ranges of land in farms projected to 2000 are based on several linear regression analyses. Regressions of land in farms through time for 1900-1969 and 1949-1969, and of land in farms versus population growth for 1900-1969 and 1949-1969, indicate that the State will have approximately 920,000 acres in farms by the year 2000. This represents only 15% of the total State land area, compared to 2.8 million acres, or 44% of the total land area, in 1969.<sup>5/</sup> The preliminary regional projections are presented in Table 1. At this rate of decline, only the Frederick and Eastern Shore regions will have significant areas in agricultural land.<sup>6/</sup>

Although forest land is not strictly considered a "use", acres suitable for potential commercial production also occupy significant proportions of regional areas. Unfortunately, data on forest areas and projected areas of production are inadequate. The only available data from 1964 and 1967 indicate that commercial forest area is declining at a Statewide rate of almost 9% per year. It is somewhat undesirable to project acreages based on such a narrow time period, but should this rate continue, commercial forest land would decrease from 2.6 million acres, or 41.6% of the total State land area, to 1.6 million acres, or 26.5% of the area by 2000. Regional projections of commercial forest area are presented in Table 1.

The remaining significant non-urban related usage of land includes undeveloped and vacant land. There are few individual county enumerations of this category, not even to consider any estimates of future areas. Most often, vacant and undeveloped land acreages are considered as a residual which is obtained after all other land uses are accounted for. Because of the lack of data, and because some land use requirements are presented as ranges, this report does not attempt to estimate acreages for the non-agricultural-forest-undeveloped land category.

It is important to note that the acres which are removed from agricultural and commercial forest land cannot be directly accounted for. Some of this land is converted to urban uses, and some is left idle as vacant or undeveloped land. The determination of what land will be converted during urban expansion depends upon factors such as location, site considerations, land market conditions, and pre-conversion/post-conversion anticipated development profit. For example, wetland areas

are obviously not the easiest land to develop for residential uses, especially compared to other well-drained land. However, from 1942 to 1967, more than 3,200 acres of wetlands have been consumed for this purpose.<sup>7/</sup> It is, therefore, very difficult to determine the quantity of agricultural land, commercial forest land, wetlands, or vacant land which will be consumed for urban development at any given time.

Unlike the total undeveloped land category, there have been estimates of the total urban development areas at the county level. The data is complete for 1958, 1960, and 1967 and for projections to 1980 and 2000. Several county reports have also reported the total developed area. A cursory analysis of these estimates in a temporal array reveals that there is general inconsistency and uncorrected duplication from one report to another. An example of this is presented in Table 5. The county reports are generally overestimated and probably reflect differences in classification. Rural non-farm residential acreages are included in some county reports and excluded in others.

The total developed area acreages and estimates for 1958, 1960, 1967, 1980 and 2000 were correlated with county populations for those years. The results revealed generally high correlations: .965, .979, .906, .980, and .979, respectively. The total developed area was also divided by the total county population to obtain a per capita consumption acreage. In Table 6, per capita consumption rates are indicated. Occasionally, the figures do not fit a consistent temporal pattern. However, regional generalizations tend to verify the relative accuracy

suggested by the high coefficients of correlation. The data indicate that per capita urban land consumption rates are generally declining in urbanizing regions such as Suburban Washington and Metropolitan Baltimore. Western Maryland and the Upper Eastern Shore generally exhibit increasing per capita rates.

The percentage of the total regional area which is comprised of the total developed area ranges from 2.1% for the Lower Eastern Shore to 23.4% for Suburban Washington for 1970, and from 2.6% to 34.6% for these same regions, respectively, for 2000. Statewide, only 6.9% of the total land area was developed by 1970, and only 10.5% will be developed by the year 2000.

The total developed area estimates are based on 1960 trend data and do not include other urban-related uses such as County, State, and Federal parks and open space. Park and open space acreages are not developed in the same sense as residential or commercial uses; however, these are uses to which the land is committed. Consequently, a more accurate estimate of urban-related development includes all acreages which are committed and are not available for development. Estimates of total committed lands for 1970 and 2000 were determined by aggregating the acreages for the various use classification in Table 1. The total committed land projections will be considered following a brief analysis of each type of urban-related commitment.

Estimates of future residential area requirements are based upon trend assumption of 1970 data. Given future populations, the 1970 persons per household densities were applied to the population projections to obtain projections of the number of dwelling units. The total dwelling units were then divided by the dwelling unit density per acre to obtain total residential acreage. As a trend projection, the method works quite well; however, its practical application may be questioned if the type of development within a county is expected to change significantly. If the change is minimal, an increase in dwelling unit density will be offset somewhat by the lower household density. An example where this would apply might be a rural, low-density unit dominated county in which 5 or 10% multi-family units were added.

For larger metropolitan counties, the density problem is not as easily balanced. Fortunately, for the Baltimore Metropolitan region, data were obtained to correct for density of development. A breakdown of household size and dwelling units per acre was obtained for four classes of development, and these were weighted based on 1970 existing ratios. The projections are still a trend assumption, but they explain the housing development quite adequately. Similar detailed breakdowns were not available for the Suburban Washington region.

The residential area requirements range from 1.2% of the total area of the Upper Eastern Shore to 11.9% of the total area of Suburban Washington in 1970, and from 1.5% to 20.3% for the same regions, respectively, for the year 2000. Statewide, total residential development accounted for only 4.3% of the total land area in 1970, and will account for only 7.3% in the year 2000.

Future area requirements for commercial and industrial uses were determined from existing ratios. The population to commercial/industrial area ratios were calculated and applied to future populations. The ratios of total residential acreage to commercial/industrial acreage were also applied to projected residential requirements. Generally, a relatively close range of area requirements were generated. In most cases, the percentages of the total county land areas represented by both ratios were identical or within .1%. Because the residential area ratio was based on an earlier projection, the closeness of the two ratios lends some confidence in their general applicability. It should be noted that some of the ratios were based on data prior to 1970 where recent data on commercial or industrial areas were not available. These few counties were in rural regions where it can be assumed that the acreage devoted to commercial and industrial development has not changed significantly. The ranges of projected commercial and industrial acreage are presented for the regions in Table 1.

From Table 1 it can be generalized that the residential to commercial/industrial ratios yield a higher estimate than the population ratios. However, for most regions, especially non-urbanized areas, the differences produce no significant change in the proportion of land area devoted to these uses. Industrial acreage generally occupied a larger proportion of the regional area. Industrial acreage also often includes zoned areas which are undeveloped; consequently, large differences in estimates can often be explained.



Commercial requirements range from .1-.2% of the area of Frederick and the Lower Eastern Shore to 1.0-1.2% of Suburban Washington for 1970, and from .1-.2% of the Lower Eastern Shore to 1.7-1.9% of the area of Suburban Washington for 2000. Industrial requirements range from .1% of Frederick to 2.0-2.3% of the Metropolitan Baltimore region for 1970, and from .2% of Frederick to 3.6-4.2% of the Metropolitan Baltimore region for 2000.

Local and county park requirements have been generated by the Department of State Planning at the regional level for 1990, and statewide open space requirements have been projected at the state level. Local park acreages are based on standard acreage/population ratios; no standards have been applied to the open space requirements because of the special purpose and unique characteristics of these areas. The available data for local and county parks and statewide open space requirements are presented in Table 1. The data indicate a concentration of local park acreage in the Suburban Washington and Metropolitan Baltimore Regions. Although not specified, statewide open space areas tend to be located in forest areas of Western Maryland and in wildlife habitat areas of the Eastern Shore. Statewide, open space acreage is expected to increase from 210,000 acres in 1970 to 330,000 acres by 1990. This is not to imply State ownership but use and conservation of public and private open space and recreation lands. Federal open space area commitments have been determined from existing ownership and use patterns.

State and Federal land other than open space can be classified as public or institutional. These lands are essentially committed to State and Federal facilities which provide services, such as hospitals and installations such as office complexes. An inventory of existing acreage was used to obtain population/area ratios which were applied to future population projections. If current ratios remain relatively constant, Federal institutional acreage will increase from 148,000 acres in 1970 to 232,000 acres by 2000. State-owned land other than open space will increase from 52,000 acres in 1970 to 81,000 acres by 2000. Regional breakdowns of these acreages are presented in Table 1.

Data are inadequate to inventory transportation and public utility acreage on the regional level. However, it is expected that most of the capital expenditures for transportation will be for improvements of the existing system rather than extensive additions of new roads. Although utility acreage is expected to increase, the Statewide percentage of the land area devoted to this usage will likely be less than 1%. Available regional data for transportation and utility acreages are presented in Table 1.

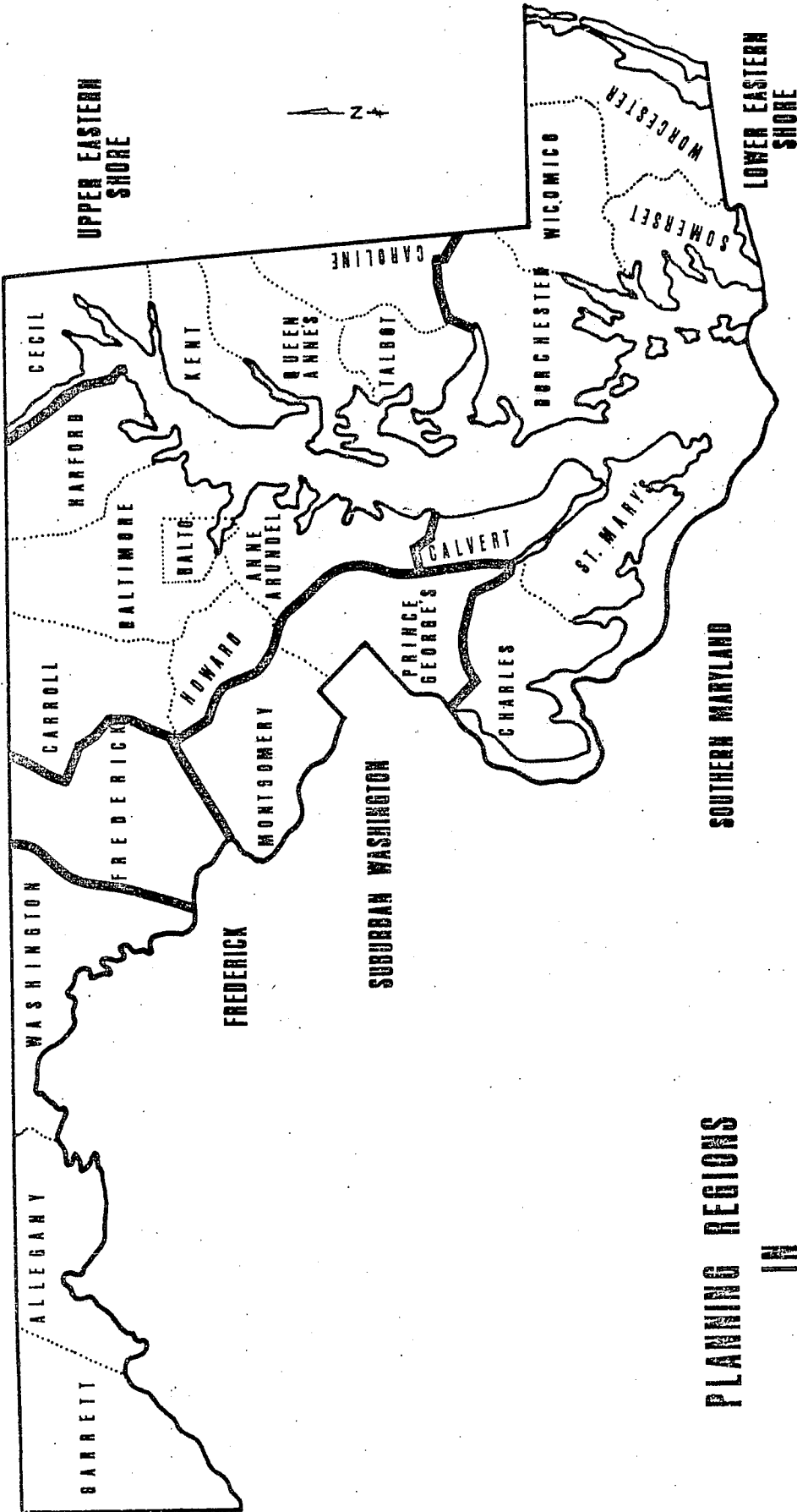
It is possible that the classification used in Table 1 is not complete. In order to compensate for any minor omissions, 3% of the residential area was assigned to include miscellaneous uses.

Total land committed for non-agricultural purposes throughout the State amounted to approximately 1.0 million acres, or 15% of the total land area, for 1970. By the year 2000, total committed lands will account for 1.7 million acres, or 26% of the State land area. Regionally, the acreages

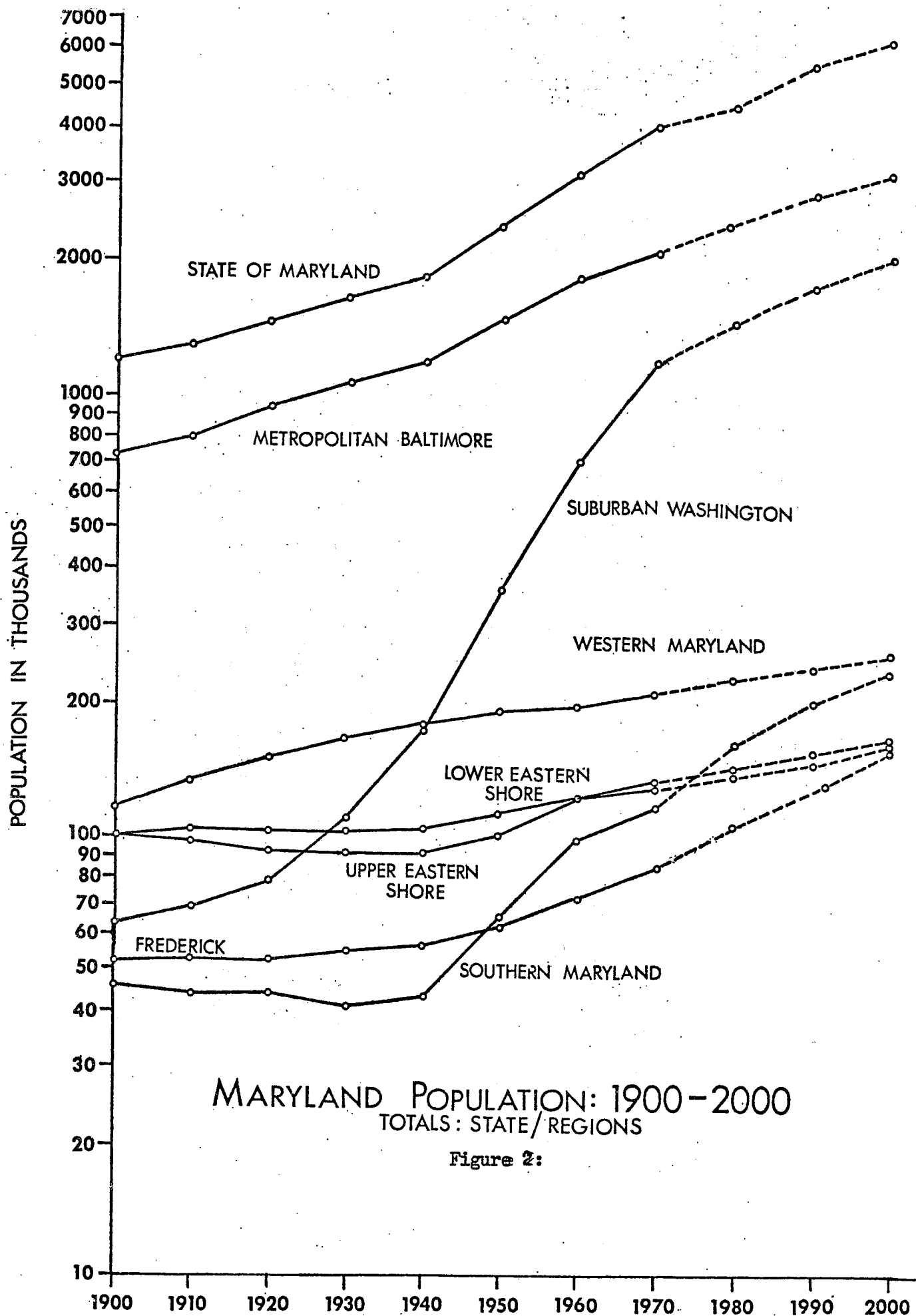
range from 40,000 acres, or 3.7% of the Upper Eastern Shore to 375,000 acres, or 25.5% of the Baltimore Metropolitan region for 1970, and from 57,000 acres, or 5.3%, to 660,000 acres, or 45.0% of the same regions, respectively, for the year 2000. The total committed lands projected from the various uses in Table 1 are best interpreted as a relative index of the scale of expected development activity within each planning region. The extent to which development proceeds in accordance with the past trend depends upon many complex factors in the land consumption and conversion process.

WESTERN MARYLAND

METROPOLITAN BALTIMORE



# PLANNING REGIONS IN MARYLAND



SOURCE: 1900-1970 U. S. Census of Population;  
1970-2000 Md. Dept. of State Planning

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

STATE OF MARYLAND

(1) Total Land Area	(2) Total Land in Agriculture	Total Commercial (3)		Developed (4)		(5) Committed Land Project		% Region	
		% Region	Forest Area	% Region	Area Project	% Region		% Region	
70 6,626,263	2,803,442	43.9	2,505,025	39.6	439,309	6.9	1,016,661- 1,025,111	15.3 15.4	
00 920,342		14.6	1,674,313	26.5	661,903	10.5	1,709,224- 1,762,169	25.7 26.5	
								66.8 67.6	
(6) Residential	(7) Commercial	(8) Industrial	Institutional (9)		Open Space (10)		(11) Transportation	(12) Utilities	(13) Other
			Federal	State	Federal	State Local			
970 282,789	28,005 31,695	43,461 48,221	147,829	51,608	49,456	210,214 36,518	131,200	27,117	8,464
000 483,136	45,379 49,933	75,371 83,762	232,056	80,914	77,547	330,618 188,109	176,000	45,600	14,494

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

WESTERN MARYLAND

	(1) Total Land Area	(2) Total Land in Agriculture	% Region	Total Commercial (3) Forest Area	% Region	Developed (4) Area Project	% Region	(5) Committed Land Project	% Region
1970	994,115	357,992	36.1	578,382	58.3	37,264	3.7	158,304- 160,864	15.9 16.1
2000		56,941	5.7	413,265	41.7	46,239	4.7	202,221- 205,605	20.3 20.6

	(6) Residential	(7) Commercial	(8) Industrial	(9) Institutional Federal State	Open Space (10) Federal State Local	(11) Transportation	(12) Utilities	(13) Other
1970	21,918	2,750 4,568	1,767 2,509	4,281 6,212	7,080 113,198 440	N.A. N.A.	N.A.	658
2000	28,816	3,416 5,819	2,382 3,363	5,204 7,552	8,598 141,389 4,000	N.A.	N.A.	864

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

## FREDERICK

	(1) Total Land Area	(2) Total Land in Agriculture	Total Commercial (3)		Developed (4)		(5) Committed Land Project		(6) (13)	
			% Region	Forest Area	% Region	Area Project	% Region	Land Project	% Region	Other
1970	424,961	253,672	59.6	108,223	25.5	11,210	2.6	40,629- 40,761	9.5	386
2000		131,070	30.8	17,041	4.0	19,053	4.5	67,641- 68,197	15.9 16.0	704
	(6) Residential	(7) Commercial	(8) Industrial	Institutional (9)		Open Space (10)		(11) Transportation	(12) Utilities	(13) Other
				Federal	State	Federal	State			
1970	12,879	628 704	463 519	1,220	5,572	5,769	5,361	8,351	N.A.	386
2000	23,485	1,146 1,283	846 947	2,227	10,197	10,544	9,810	9,000	N.A.	704



TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

METROPOLITAN BALTIMORE

(1) Total Land Area	(2) Total Land in Agriculture	Total Commercial (3)		Developed (4)		(5) Committed Land Project		% Region	
		% Region	Forest Area	% Region	Area Project	% Region		% Region	
1970	1,461,588	41.1	434,537	30.1	213,279	14.7	375,206- 381,186	25.6 26.0	
2000	68,924	4.8	324,226	22.5	273,034	18.9	656,742- 668,175	44.9 45.7	

(6) Residential		(7) Commercial	(8) Industrial		Institutional (9)		Open Space (10)		(11) Transportation	(12) Utilities	(13) Other
			Federal	State	Federal	State	Federal	State	Local		
1970	121,609	12,834 14,642	29,308 33,480	97,799	23,878	16,825	692	15,896	25,600	27,117	3,648
2000	228,097	21,302 24,436	52,436 60,735	149,009	36,436	25,662	1,056	99,421	36,480	N.A.	6,843

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

## SUBURBAN WASHINGTON

	(1) Total Land Area	(2) Total Land in Agriculture	Total		Developed (4)		(5)	
			Commercial Forest Area	% Region	Area Project	% Region	Committed Land Project	% Region
1970	633,629	208,162	156,998	25.1	146,739	23.4	160,999- 159,501	25.4 25.1
2000		-81,613*	2,889	.5	216,341	34.6	324,965- 322,293	51.2 50.8

	(6) Residential	(7) Commercial	(8) Industrial	Institutional (9)		Open Space (10)		(11) Transportation	(12) Utilities	(13) Other
				Federal	State	Federal	State			
1970	75,411	7,298 6,496	6,310 5,614	25,568	6,601	6,501	5,891	15,360	N.A.	2,262
2000	128,452	12,351 10,922	10,688 9,445	43,520	11,238	11,071	10,030	36,480	N.A.	3,854

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

UPPER EASTERN SHORE

	(1) Total Land Area	(2) Total Land in Agriculture	Total Commercial (3)		Developed (4)		(5) Committed Land Project		% Region	
			% Region	Forest Area	% Region	Area Project	% Region	Land Project	% Region	% Region
1970	1,062,776	690,655	68.5	286,316	27.8	34,405	3.3	40,295- 40,253	3.7	3.7
2000		461,453	44.8	81,197	7.9	42,414	4.1	56,881- 57,938	5.3	5.4

	(6) Residential	(7)		(8)		(9)		(10)		(11)		(12)		(13) Other
		Commercial	Industrial	Federal	State	Federal	State	Federal	State	Transportation	Utilities	Transportation	Utilities	
1970	12,954	1,682 2,006	2,182 1,816	5,382	2,498	2,291	12,287	2,291	12,287	N.A.	N.A.	N.A.	N.A.	389
2000	16,077	2,254 2,646	2,378 3,043	6,901	3,199	2,935	15,755	2,935	15,755	N.A.	N.A.	N.A.	N.A.	482

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

SOUTHERN MARYLAND

	(1) Total Land Area	(2) Total Land in Agriculture	(3) Total Commercial Forest Area		(4) Developed Area Project		(5) Committed Land Project		% Region	% Region
			% Region	Forest Area	% Region	Area Project	% Region	Land Project		
1970	687,826	264,114	40.4	383,536	57.4	27,780	4.1	37,270- 36,501	5.4 5.3	
2000		15,904	2.4	196,371	29.4	35,345	5.3	94,397- 92,556	13.7 13.4	

	(6) Residential		(7) Commercial		(8) Industrial		(9) Institutional		(10) Open Space		(11) Transportation		(12) Utilities		(13) Other	
	Federal	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal	State
1970	15,320	1,366 1,034	1,689 1,252	10,264	473	0	6,738	960	N.A.	N.A.	N.A.	N.A.	460			
2000	31,227	3,007 2,227	3,863 2,802	21,062	973	0	13,837	19,491	N.A.	N.A.	N.A.	N.A.	937			

TABLE 1: 1970-2000 LAND USE DEMANDS, BY PLANNING REGION

LOWER EASTERN SHORE

	(1) Total Land Area	(2) Total Land in Agriculture		Total Commercial (3) Forest Area		% Region		Developed (4) Area Project		% Region		(5) Committed Land Project		% Region	
1970	1,361,386	450,014		557,033		39.2		24,385		49.0		113,738-		2.1	
												115,528			
														8.3	
														8.4	
2000		186,050		639,324		16.4		29,477		56.3		150,948-		2.6	
												153,420			
														11.0	
														11.2	

	(6) Residential		(7) Commercial		(8) Industrial		(9) Institutional		(10) Open Space		(11) Transportation		(12) Utilities		(13) Other	
1970	22,698		1,447		1,742		3,315		49,914		N.A.		N.A.		681	
			1,948		3,031											
2000	29,982		1,903		2,215		4,204		64,400		N.A.		N.A.		899	
			2,600		3,990											

TABLE 1:

Sources/Notes:

- (1) Wetland acreages (included in total land area) from Maryland Department of State Planning, Wetlands in Maryland, Vol. 2, Technical Report, 1969. Present acreage from inventory is enumerated.  
Total land area from Maryland Soil and Water Conservation Needs Inventory, 1967.
- ~~(2) Agricultural acreages based on linear regression analyses of land in farms vs. population and decline in land through time, from 1900 to 1969.~~
- (3) Forest areas for projections based on Northeast Forest Experiment Station, Timber Resources of Maryland, 1967.
- (4) Total developed area for 1970 based on mean of per capita land consumption rates for 1960 and 1980 and applied to 1970 regional population. Per capita rates for 1960 and 1980 based on Maryland Department of State Planning, Inventory of Land Characteristics by Resource Areas, 1960. Year 2000 developed area projection applied directly from the Inventory.
- (5) Committed land area projections represent the summation of the projected ranges of areas for the various urban-related uses in line 2 of Table 1 (footnoted items 6 to 13).
- (6) Notes:
  1. Method:  $\text{Population} \div \text{household size} = \text{number of dwelling units}$ .  
 $\text{Dwelling units} \div \text{density/acre} = \text{number of acres}$ .
  2. Density of dwelling units/acre based on ratio of residential units to total residential land area for previous land use studies (most are 1970 data).
  3. Projections assume continuation of 1970 dwelling densities and household size. In rural counties, it is expected that increased densities due to more multi-family development will be balanced by a corresponding decrease in household size. Baltimore regional density corrections based on data from Regional Planning Council.

TABLE 1:

Sources/Notes (Continued)

Sources:

2000 population projections: Maryland Department of State Planning, Planning Research Division.

1970 Household size from Morton Hoffman & Company, Inc., Memorandum B-2, Population, Housing and Household Trends & Projections, 1972.

1970 Density ratios and household size for Metropolitan Baltimore from Regional Planning Council, 1970 Land Use Analysis, 1973.

- (7) Two ratios were used to determine commercial area commitments. The first figure of each range is the ratio of population to existing commercial area applied to the projected population for 2000. The second estimate is the ratio of existing residential area to existing commercial area applied to the projected residential area for 2000. Existing commercial areas are based on land use inventories. It should be noted that this is a somewhat crude methodology due to unavailability of reliable data.
- (8) Industrial area commitments were determined according to the same procedure reported in footnote (7) above.
- (9) Federal and State institutional acreage from inventory by Maryland Department of State Planning, 1973.
- (10) Open Space acreage from inventory of State and Federal lands by Maryland Department of State Planning, 1973, Requirements are for 1990.
- (11) Transportation data, where available, from 1974 National Transportation Study, U.S. Department of Transportation.
- (12) Utility acreage, where tabulated, from Maryland Department of State Planning, 1973.
- (13) Other urban-related land uses defined as 3% of the residential acreage.

TABLE 2 : MARYLAND POPULATION: 1900-2000, BY COUNTY AND REGION

	1900	1910	1920	1930	1940	1949	1950	1954
Western Maryland	116,528	132,133	149,310	164,888	177,792	188,809	189,701	192,295
Carrett	17,701	20,105	19,678	19,908	21,981	21,313	21,259	20,902
Allegany	53,694	62,411	69,938	79,098	86,973	89,363	89,556	87,266
Washington	45,133	49,617	59,694	65,882	68,838	78,133	78,886	84,127
Frederick	51,920	52,673	52,541	54,440	57,312	61,914	62,287	66,385
Metropolitan Baltimore	718,176	798,392	931,413	1,068,356	1,174,589	1,435,838	1,457,181	1,604,171
Anne Arundel	39,620	39,553	43,408	55,167	68,375	113,715	117,392	155,320
Baltimore City	508,957	558,485	733,826	804,874	859,100	942,912	949,708	945,167
Baltimore County	90,755	122,349	74,817	124,565	155,825	261,689	270,273	364,689
Carroll	33,860	33,934	34,245	35,978	39,054	44,321	44,907	48,256
Harford	28,269	27,965	29,291	31,603	35,060	50,528	51,782	62,381
Howard	16,715	16,106	15,826	16,169	17,175	22,673	23,119	28,658
Suburban Washington	60,349	68,236	78,268	109,301	173,402	344,694	358,583	502,972
Montgomery	30,451	32,089	34,921	49,206	83,512	158,364	164,401	239,425
Prince George's	29,898	36,147	43,347	60,095	89,490	186,330	194,182	263,547
Upper Eastern Shore	98,402	96,391	91,597	90,610	90,681	98,628	99,274	108,720
Caroline	16,248	19,216	18,652	17,387	17,549	18,183	18,234	18,756
Cecil	24,662	23,759	23,612	25,827	26,407	32,834	33,356	39,753
Kent	18,786	16,957	15,026	14,242	13,465	13,661	13,677	14,444
Queen Anne's	18,364	16,839	16,001	14,571	14,476	14,571	14,579	15,425
Talbot	20,342	19,620	18,306	18,583	18,784	19,379	19,428	20,342
Southern Maryland	45,067	43,741	43,561	40,883	42,722	62,981	64,626	74,268
Calvert	10,223	10,325	9,744	9,528	10,484	11,978	12,100	13,683
Charles	17,662	16,386	17,705	16,166	17,612	22,979	23,415	27,307
St. Mary's	17,182	17,030	16,112	15,189	14,626	28,024	29,111	33,278
Lower Eastern Shore	97,602	103,780	102,971	103,048	104,746	110,854	111,349	115,907
Dorchester	27,962	28,669	27,895	26,813	28,006	27,829	27,815	28,602
Somerset	25,923	26,455	24,602	23,382	20,965	20,761	20,745	20,269
Wicomico	22,852	26,815	28,165	31,229	34,530	39,258	39,641	43,639
Worcester	20,865	21,841	22,309	21,624	21,245	23,006	23,148	23,397
State	1,188,044	1,295,346	1,449,661	1,631,526	1,821,224	2,303,718	2,343,001	2,665,018

Sources: U. S. Census of Population: 1930, 1940, 1950, 1960, 1970.  
Maryland Center for Health Statistics (Non-Census Years 1949-1959)  
Final Vital Statistics (Non-Census Reports 1961-1971)

Maryland Department of State Planning: Preliminary Projections, 1980, 1990, 2000.



Table 2 (Continued)

	1959	1960	1964	1969	1970	1980	1990	2000
Western Maryland	193,894	195,808	210,710	204,770	209,349	225,500	239,500	254,500
Garrett	20,253	20,420	22,460	20,640	21,476	22,500	23,500	24,500
Allegany	83,831	84,169	87,750	82,570	84,044	85,000	86,000	87,000
Washington	89,810	91,219	100,500	101,560	103,829	118,000	130,000	143,000
Frederick	71,460	71,930	82,860	82,830	84,927	105,000	130,000	155,000
Metropolitan Baltimore	1,753,225	1,803,745	1,909,880	2,033,450	2,070,670	2,448,000	2,799,000	3,159,000
Anne Arundel	197,095	206,634	218,940	285,760	297,539	428,000	522,000	640,000
Baltimore City	919,113	939,024	922,270	900,500	905,759	900,000	900,000	900,000
Baltimore County	475,201	492,428	541,610	609,320	621,077	750,000	850,000	950,000
Carroll	51,899	52,785	57,240	67,350	69,006	90,000	112,000	134,000
Harford	74,899	76,722	92,920	110,590	115,378	155,000	195,000	235,000
Howard	35,018	36,152	46,900	59,930	61,911	125,000	220,000	300,000
Suburban Washington	666,236	698,323	900,130	1,148,140	1,183,376	1,465,000	1,750,000	2,015,000
Montgomery	324,425	340,928	414,330	510,600	522,809	675,000	810,000	925,000
Prince George's	341,811	357,395	485,800	637,540	660,567	790,000	940,000	1,090,000
Upper Eastern Shore	119,359	121,498	133,350	127,400	130,322	142,000	153,000	167,000
Caroline	19,226	19,462	19,760	19,560	19,781	20,000	20,500	21,000
Cecil	47,596	48,408	56,530	52,390	52,291	59,000	64,000	70,000
Kent	15,092	15,481	16,410	15,810	16,146	17,000	18,000	20,000
Queen Anne's	16,301	16,569	17,560	17,530	18,422	20,000	22,000	24,000
Talbot	21,144	21,578	23,090	22,110	23,682	26,000	28,500	32,000
Southern Maryland	86,664	87,313	98,670	110,730	115,748	162,000	200,000	238,000
Calvert	15,436	15,826	17,360	19,830	20,682	27,000	32,000	38,000
Charles	32,425	32,572	36,930	45,340	47,678	80,000	108,000	135,000
St. Mary's	38,803	38,915	44,380	45,560	47,388	55,000	60,000	65,000
Lower Eastern Shore	119,986	122,072	130,040	124,500	127,007	136,000	146,700	161,000
Dorchester	29,447	29,666	31,300	28,860	29,405	30,000	30,700	32,000
Somerset	19,375	19,623	20,140	18,610	18,924	19,000	20,000	21,000
Wicomico	47,994	49,050	53,260	52,900	54,236	60,000	66,000	73,000
Worcester	23,170	23,733	25,340	24,130	24,442	27,000	30,000	35,000
State	3,010,824	3,100,689	3,465,640	3,831,820	3,922,399	4,683,500	5,420,200	6,119,500

TABLE 3: PERCENT CHANGE IN POPULATION: 1920 - 2000 BY REGION

	1920-30	1930-40	1940-50	1950-60	1960-70	1970-80	1980-90	1990-2000
Western Maryland	10.4	7.8	6.7	3.2	6.9	7.7	6.2	6.2
Frederick	3.6	5.3	8.7	15.5	18.1	23.6	23.8	19.2
Metro. Baltimore	14.7	9.9	24.0	23.8	14.8	16.3	16.2	12.9
Suburban Washington	39.6	58.6	106.8	94.7	69.4	23.8	19.4	15.1
Upper Eastern Shore	- 1.1	.1	9.5	22.4	7.3	9.0	7.7	9.2
Southern Maryland	- 6.1	4.5	51.3	35.1	32.6	40.0	23.4	19.0
Lower Eastern Shore	.1	1.6	6.3	9.6	4.0	7.1	7.9	9.7
STATE	12.5	11.6	28.6	32.3	26.5	19.4	15.7	13.4

TABLE 4: MARYLAND POPULATION DENSITY: 1940-2000, BY COUNTY AND REGION  
PERSONS PER SQUARE MILE

	1940	1950	1960	1970	1980	1990	2000
Western Maryland	114.7	122.4	126.3	135.1	145.5	154.5	164.2
Garrett	33.2	32.1	30.8	32.6	34.1	35.6	37.2
Allegany	204.2	210.2	197.6	196.4	198.7	201.1	203.4
Washington	149.0	170.7	197.4	226.3	257.1	283.2	311.5
Frederick	86.3	93.8	108.3	127.6	157.8	195.3	232.9
Metro. Baltimore	520.9	646.2	799.9	919.1	1085.6	1241.2	1400.9
Anne Arundel	164.0	281.5	495.5	705.9	1012.3	1234.6	1513.7
Baltimore City	10685.3	12021.6	11886.4	11465.3	11494.3	11494.3	11494.3
Baltimore County	256.3	443.1	809.9	1059.3	1255.0	1422.4	1589.7
Carroll	86.2	98.5	116.5	151.3	197.4	245.6	293.9
Harford	78.2	115.6	171.3	254.6	342.2	430.5	518.8
Howard	68.7	92.1	144.6	246.7	497.8	876.1	1194.7
Suburban Washington	177.3	366.6	714.0	1210.0	1498.0	1789.4	2060.3
Montgomery	170.2	332.8	691.5	1054.9	1360.9	1633.1	1864.9
Prince George's	184.5	400.4	736.9	1365.4	1632.9	1942.1	2252.1
Upper Eastern Shore	56.4	61.7	75.6	81.0	88.3	95.1	103.8
Caroline	54.8	57.0	60.8	61.5	62.2	63.8	65.3
Cecil	75.0	94.8	137.5	147.3	163.3	177.1	193.7
Kent	47.4	48.2	54.5	57.6	60.6	64.2	71.3
Queen Anne's	38.8	39.1	44.4	49.1	53.3	58.6	64.0
Talbot	67.3	69.6	77.3	90.7	99.6	109.2	122.6
Southern Maryland	40.9	61.9	83.6	110.9	155.2	191.6	228.0
Calvert	47.8	55.3	72.3	95.5	124.7	147.8	175.5
Charles	38.4	51.1	71.1	103.8	174.2	235.2	294.0
St. Mary's	39.8	79.3	106.0	126.9	147.4	160.8	174.2
Lower Eastern Shore	59.0	62.7	68.8	71.6	76.6	82.2	90.7
Dorchester	48.3	48.0	51.1	49.5	50.5	51.7	53.9
Somerset	63.1	62.5	59.1	55.8	56.1	59.0	62.0
Wicomico	90.9	104.3	129.1	142.5	157.6	173.4	191.8
Worcester	44.0	47.9	49.1	51.0	56.4	62.6	73.1
STATE	184.4	237.1	314.0	396.6	447.3	548.9	622.8

SOURCES: U. S. Bureau of the Census. Census of Population, Maryland. 1940-1970.  
Md. Dept. of State Planning. Preliminary population estimates 1980-2000.

TABLE 5: COMPARISON OF TOTAL DEVELOPED AREA: 1958-1973, BY COUNTY

	1958	1959	1960	1961	1962	1963	1964	1965
Western Maryland								
Garrett	2,964		2,990					
Allegany	14,273		14,212	19,194			64,000	
Washington	12,175		18,420					
Frederick	11,317	10,351	9,762					
Metro. Baltimore								
Anne Arundel	31,479		31,478					62,005
Baltimore City	50,420							
Baltimore County	79,676		79,676					
Carroll	7,548		7,564			27,783		
Harford	9,885		9,885					
Howard	18,267-5,629		5,574					
Suburban Washington								
Montgomery	40,025		52,629				54,602	
Prince George's	41,729		41,871				66,424	
Upper Eastern Shore								
Caroline	4,493		10,370					10,370
Cecil	4,627		6,300		6,300			
Kent	3,260		5,552					8,570
Queen Anne's	3,499		6,661		10,727			
Talbot	3,829		3,829	774				
Southern Maryland								
Calvert	2,324		3,411				4,526	
Charles	5,362		12,764				24,622	
St. Mary's	12,771		9,197					21,340
Lower Eastern Shore								
Dorchester	7,198		6,317		18,110			
Somerset	4,179		4,685			4,774		
Wicomico	5,001		6,000					
Worcester	8,416		5,889	6,105				
STATE	372,079		355,036					

TABLE 5: (CONTINUED)

	1966	1967	1968	1969	1970	1971	1972	1973
Western Maryland								
Garrett		4,208						9,750
Allegany		15,219						16,108
Washington		17,177						19,688
Frederick		38,611						
Metro. Baltimore								
Anne Arundel		44,950			67,753			
Baltimore City		50,420			45,477			
Baltimore County		102,637			116,261			
Carroll		11,186			17,310			
Harford		15,211			20,409			
Howard		14,194			25,974			
Suburban Washington								
Montgomery		52,984						
Prince George's		51,083						
Upper Eastern Shore								
Caroline								
Cecil		4,850						
Kent		6,835						
Queen Anne's		4,066						
Talbot		5,846						
Southern Maryland		3,821						
Calvert		3,434						
Charles		10,160						
St. Mary's		17,109						
Lower Eastern Shore								
Dorchester		17,366						
Somerset		4,458						
Wicomico		7,727						
Worcester		9,097						
STATE		512,649						

Notes: ■ Indicates estimates recopied for another time period.

■ Indicates estimates which are deviant from trend to a great degree.

Sources: 1958, 1967 - Conservation Needs Inventory  
 1960, Maryland Department of State Planning - Land Characteristics Inventory  
 Other figures from county plans, special reports, etc.

TABLE 6: PER CAPITA URBAN LAND CONSUMPTION:  
1958, 1960, 1967, 1980, 2000,  
BY COUNTY AND REGION.

	1958	1960	1967	1980	2000
Western Maryland	.155	.182	.167	.174	.182
Garrett	.156	.146	.176	.141	.162
Allegany	.172	.169	.174	.176	.185
Washington	.139	.202	.160	.178	.183
Frederick	.163	.136	.180	.128	.123
Metro. Baltimore	.104	.102	.120	.104	.102
Anne Arundel	.167	.152	.162	.123	.111
Baltimore City	.051	.054	.055	.056	.056
Baltimore County	.179	.162	.176	.164	.162
Carroll	.138	.143	.175	.112	.107
Harford	.148	.154	.145	.113	.098
Howard	.184	.129	.267	.142	.089
Suburban Washington	.130	.135	.101	.114	.107
Montgomery	.138	.154	.117	.128	.116
Prince George's	.124	.117	.088	.102	.100
Upper Eastern Shore	.167	.269	.208	.258	.254
Caroline	.239	.533	.240	.526	.528
Cecil	.096	.130	.125	.149	.157
Kent	.210	.359	.260	.350	.351
Queen Anne's	.230	.402	.326	.349	.311
Talbot	.187	.177	.250	.171	.182
Southern Maryland	.244	.290	.312	.190	.148
Calvert	.155	.216	.271	.164	.162
Charles	.179	.392	.244	.188	.123
St. Mary's	.327	.236	.393	.204	.193
Lower Eastern Shore	.204	.188	.303	.196	.183
Dorchester	.250	.213	.591	.220	.252
Somerset	.214	.239	.229	.250	.242
Wicomico	.103	.122	.146	.140	.124
Worcester	.337	.248	.349	.226	.207
STATE	.125	.114	.143	.110	.108

Notes: Per capita rates derived from total population ÷ total urban development area. Assumes constant population for Baltimore City after 1980.

Sources: 1958, 1967 total developed areas from the Maryland Soil and Water Conservation Needs Inventory, 1971.  
1960, 1980, 2000 total developed areas from the Maryland Department of State Planning's Inventory of Land Characteristics, 1960.

# FOOTNOTES

- 1/ Maryland Department of State Planning. Wetlands in Maryland, Vol. II: Technical Report, January, 1969, Appendix A.
- 2/ University of Maryland. Agriculture '76. Vol. III: Resources and Services in Production, p. 3.
- 3/ U. S. Census of Population, 1970; 2000 Population total for State from Planning Research Division, Maryland Department of State Planning.
- 4/ Specific agricultural data and analysis are included in the final report, Technical Report #4, A Historic Analysis of Land Consumption and Conversion in Maryland.
- 5/ University of Maryland, Op. Cit., p. 3.
- 6/ Although the Frederick region will experience significant urban growth, the size of the county will still permit extensive acreage for agriculture. In 1969, Frederick County had more land in farms than any other county, and had more land in farms than the Suburban Washington region and almost as much as Southern Maryland.
- 7/ Maryland Department of State Planning, Op. Cit., Appendix A